

A Multidisciplinary Prosthodontic Approach to Severe Deep Bite with Temporomandibular Joint Pain and Partial Maxillary Edentulism: A Case Report

Dr. Samiksha Singla¹, Dr. Geetanjali Singh², Dr. Vishal Katna³,
Dr. Himanshu Kapoor⁴, Dr. Ayushi Singla⁵

¹MDS Student

²Reader

^{3,4}Professor

⁵Senior Lecturer

Abstract

Background: Rehabilitation of patients presenting with severe deep bite, temporomandibular joint (TMJ) pain, multiple missing teeth, and supra-erupted mandibular anterior teeth is clinically demanding. Restoring function while re-establishing an appropriate occlusal vertical dimension (OVD) requires meticulous diagnosis and interdisciplinary treatment planning.

Case Presentation: A middle-aged patient presented with chronic TMJ pain, severe deep bite, multiple missing teeth in the maxillary arch, and supra-eruption of the mandibular anterior teeth resulting in reduced restorative space and compromised esthetics. Comprehensive clinical and radiographic evaluation revealed excessive overbite, loss of posterior support, and collapsed occlusion. A full-mouth fixed prosthodontic rehabilitation was planned. The OVD was increased by 3 mm using provisional restorations to assess patient adaptation before definitive treatment. Following successful adaptation, fixed prostheses were fabricated to restore posterior support, establish mutually protected occlusion, improve esthetics, and relieve TMJ symptoms.

Results: The patient demonstrated satisfactory adaptation to the increased OVD without adverse muscular or TMJ symptoms. Occlusal stability, masticatory efficiency, facial esthetics, and speech improved significantly. TMJ discomfort reduced substantially during follow-up, and the patient expressed high satisfaction with treatment outcomes.

Conclusion: Controlled elevation of OVD by 3 mm using fixed prosthodontic rehabilitation represents a predictable treatment option for patients with severe deep bite associated with TMJ pain and loss of posterior support. Proper diagnosis, provisionalization, and careful occlusal management are essential for long-term success.

Keywords: Deep bite, Occlusal vertical dimension, Temporomandibular joint disorders, Fixed prosthodontics, Full-mouth rehabilitation, Supra-eruption.

Introduction

Deep bite is one of the most prevalent vertical malocclusions encountered in restorative dentistry. Although mild deep bite may remain asymptomatic, severe deep bite frequently results in functional impairment, compromised esthetics, excessive tooth wear, periodontal trauma, and temporomandibular joint dysfunction. The condition becomes considerably more complex when accompanied by multiple missing posterior teeth, as the loss of posterior occlusal support accelerates occlusal collapse and contributes to reduced occlusal vertical dimension.

Long-standing absence of posterior teeth often causes supra-eruption of opposing teeth, particularly the mandibular anterior teeth, thereby reducing restorative space and complicating prosthetic rehabilitation. Excessive overbite may further increase the loading on anterior teeth and temporomandibular joints, resulting in pain, muscle fatigue, restricted mandibular movements, and compromised mastication.

Management of such patients requires comprehensive evaluation of the stomatognathic system, including occlusal analysis, assessment of the TMJ, periodontal status, remaining dentition, and available restorative space. Restoration of the occlusal vertical dimension should be performed cautiously because excessive alteration may adversely affect muscular function and patient comfort. Contemporary evidence suggests that moderate increases in OVD can be successfully achieved when accompanied by an adequate period of provisionalization and careful monitoring.

This case report describes the successful management of a patient with severe deep bite, poor esthetics, chronic TMJ pain, multiple missing maxillary teeth, and supra-erupted mandibular anterior teeth using full-mouth fixed prosthodontic rehabilitation with a controlled increase in occlusal vertical dimension of 3 mm.

Case Presentation

A patient reported to the Department of Prosthodontics and Crown & Bridge, Himachal Dental College with the chief complaints of difficulty in chewing, pain in the jaw joints during mastication, inability to chew on both sides, poor dental appearance, and sensitivity while biting.

The patient reported progressive loss of multiple maxillary teeth over several years. Since the missing teeth had never been replaced, chewing gradually shifted to the remaining anterior teeth. The patient also noticed increasing jaw discomfort and difficulty in opening the mouth after prolonged chewing.

There was no relevant medical history or systemic condition that contraindicated prosthodontic treatment.

Clinical Examination

Extraoral examination revealed:

- Reduced lower facial height.
- Mild tenderness over both temporomandibular joints.
- Tenderness of the masseter muscles.
- Audible clicking during mandibular opening.
- No significant limitation in mouth opening.

Intraoral examination demonstrated:

- Severe deep bite.
- Multiple missing teeth in the maxillary arch.
- Loss of posterior occlusal support.
- Supra-erupted mandibular anterior teeth.

- Reduced restorative interarch space.
- Generalized attrition of remaining teeth.
- Stable periodontal condition with satisfactory oral hygiene.

Occlusal evaluation showed:

- Excessive vertical overlap.
- Collapse of occlusal vertical dimension.
- Premature anterior contacts.
- Absence of stable bilateral posterior contacts.
- Functional interferences during mandibular excursions.

Radiographic examination confirmed healthy supporting bone around the remaining teeth with no significant periapical pathology.

Diagnosis

The patient was diagnosed with:

- Severe deep bite.
- Reduced occlusal vertical dimension.
- Multiple missing maxillary teeth.
- Supra-erupted mandibular anterior teeth.
- Occlusal instability.
- Temporomandibular joint dysfunction secondary to occlusal collapse.

Treatment Objectives

The primary objectives included:

- Relief of TMJ pain.
- Restoration of posterior support.
- Correction of deep bite.
- Creation of adequate restorative space.
- Increase in occlusal vertical dimension by 3 mm.
- Re-establishment of functional occlusion.
- Improvement of esthetics.
- Long-term preservation of remaining teeth.

Treatment Planning

Several treatment options were discussed with the patient. Considering the remaining dentition, periodontal health, patient preference, and financial considerations, a full-mouth fixed prosthodontic rehabilitation was selected.

A diagnostic wax-up was completed to determine the proposed increase in OVD. Clinical assessment suggested that a controlled increase of 3 mm would provide adequate restorative space while maintaining neuromuscular comfort.

Clinical Procedure

Diagnostic Phase

Primary impressions were made using irreversible hydrocolloid.

Diagnostic casts were mounted on a semi-adjustable Hanau articulator using a facebow transfer and centric relation record.

Occlusal analysis confirmed loss of vertical dimension and insufficient restorative space.

A diagnostic wax-up was performed at an increased OVD of 3 mm. After performing mock preparation on mounted cast.



Pre operative photograph



Mounting done and wax up done

Provisional Phase

All planned abutment teeth were prepared following standard prosthodontic principles.

Provisional fixed restorations were fabricated at the proposed increased vertical dimension.

The patient functioned with the provisional restorations for several weeks.

During this period, the following parameters were evaluated:

- TMJ discomfort
- Masticatory efficiency
- Speech
- Muscle tenderness
- Facial appearance
- Patient comfort
- Occlusal stability

The patient adapted well without development of new symptoms.

TMJ pain gradually reduced during the adaptation period.

Definitive Prosthodontic Rehabilitation

Final impressions were made using elastomeric impression material.



Teeth preparation done

Interocclusal records were obtained at the verified increased OVD.
Master casts were articulated.



Temporization done

Metal try-in was performed to verify passive fit.



Metal try in made

Porcelain build-up was completed following esthetic evaluation.
Definitive fixed prostheses were cemented using resin-modified glass ionomer cement.



Final insertion

Occlusion was carefully refined.

A mutually protected occlusal scheme was established with:

- Bilateral simultaneous posterior contacts in centric relation.
- Stable centric stops.
- Anterior guidance during protrusion.
- Elimination of balancing side interferences.

Outcome

Immediately following treatment, the patient reported improved chewing efficiency and enhanced facial appearance.

Follow-up evaluations demonstrated:

- Significant reduction in TMJ pain.
- Improved mandibular function.

- Stable posterior occlusion.
- Correction of excessive overbite.
- Increased interarch restorative space.
- Improved phonetics.
- Better patient confidence.
- Excellent adaptation to the increased vertical dimension.

No complications such as muscle fatigue, prosthesis fracture, occlusal instability, or discomfort were observed during the follow-up period.

Discussion

Loss of posterior support is a major contributing factor to progressive occlusal collapse. The absence of posterior occlusal stops allows continued eruption of opposing teeth and overclosure of the mandible, resulting in excessive anterior loading and reduction of the occlusal vertical dimension. Such biomechanical changes frequently contribute to temporomandibular disorders, impaired mastication, and accelerated tooth wear.

Deep bite rehabilitation is challenging because restoration of function requires simultaneous correction of vertical dimension, occlusal relationships, and esthetics. Increasing the OVD should be performed conservatively after careful assessment of the patient's adaptive capacity. Several clinical studies have demonstrated that moderate increases in OVD ranging from 2 to 5 mm are generally well tolerated when introduced gradually using provisional restorations.

In the present case, increasing the OVD by 3 mm successfully created restorative space without compromising patient comfort. The provisional phase played a critical role in evaluating neuromuscular adaptation before fabrication of definitive prostheses. Progressive reduction of TMJ symptoms suggested that redistribution of occlusal forces and restoration of posterior support contributed to improved joint function.

The establishment of a mutually protected occlusal scheme minimized excessive loading of anterior teeth while ensuring efficient posterior support during mastication. Careful occlusal adjustment further reduced functional interferences, thereby enhancing long-term stability of the rehabilitation.

This case highlights the importance of comprehensive diagnosis, accurate treatment planning, and controlled alteration of the occlusal vertical dimension in managing complex restorative patients. Although long-term follow-up remains essential, the favorable short-term clinical outcome supports the predictability of fixed prosthodontic rehabilitation in similar clinical situations.

Conclusion

Management of severe deep bite associated with TMJ pain, multiple missing maxillary teeth, and supra-erupted mandibular anterior teeth requires an individualized and multidisciplinary approach. Restoration of posterior support together with a carefully controlled increase in occlusal vertical dimension can successfully re-establish functional occlusion and improve patient comfort.

A 3-mm increase in occlusal vertical dimension using provisional restorations followed by definitive fixed prosthodontic rehabilitation resulted in significant improvement in TMJ symptoms, occlusal stability, masticatory efficiency, and esthetics. Thorough diagnostic evaluation, careful occlusal planning, and continuous follow-up remain fundamental for achieving predictable long-term outcomes in full-mouth rehabilitation.

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